

out over several seconds and sounding somewhat like a human being beginning to vomit. It follows rapidly after the "woe, woe, woe," &c., as a rule, and the gular bag dilates to the greatest size with this sound, occasionally reaching a diameter of nearly 8 inches. The "moo" is made mostly during inspiration.

(3) What I can best describe as a wailing-shriek like the word "wair" shrieked out for twenty or thirty seconds and sometimes longer, the voice being alternately raised and lowered a little. It usually follows rapidly after the "woe, woe, woe," &c., and is about as often heard as no. 2—the gurgling "moo." It is, however, louder than the "moo."

(4) A "ho, ho, ho," &c., repeated, as a rule, four or five times. I have only heard it on a very few occasions and it is not nearly so loud as the previous three sounds.

(5) A squeal somewhat resembling the noise made by some Eagles. This is as rare as the "ho, ho, ho," &c., and not so loud as the first three sounds.

When at rest the gular bag is black in sunlight and slightly wrinkled, but on dilatation it becomes dull red. In its walk *S. syndactylus* is bipedal like *Hyllobates*.

EXHIBITIONS AND NOTICES.

March 7th, 1911.

Dr. A. SMITH WOODWARD, F.R.S., Vice-President,
in the Chair.

THE SECRETARY exhibited a series of lantern-slides prepared from photographs kindly given to him by Mr. CARL HAGENBECK, Silver Medallist of the Society, and illustrating some of the most remarkable features of Mr. Hagenbeck's new Tierpark at Stellingen near Hamburg.

Mr. R. I. POCOCK, F.L.S., F.Z.S., on behalf of Mr. ERNEST C. OBERHOLTZER, exhibited a large number of lantern-slides and photographs illustrating the habits of Moose. Mr. Oberholtzer had presented to the Society the series of enlargements exhibited and communicated the following account of

Some Observations on Moose.

Of late it has become almost a heresy to associate big game with any land but Africa. Like the bonneted old lady in the corner, even America, humiliated, lives in the past; the stride of the elephant steadily lengthens; and one would suppose that all save the jungle folk must soon be content with their barn-yards

and menageries. What a consolation, therefore, to find in the temperate zone a region where large wild animals are not only numerous but increasing! Such was my own good fortune in the forested lakeland tributary to Rainy Lake, Ontario, where I spent five months in 1909 and the month of June 1910, canoeing with a Red Indian. Besides numerous lesser animals, we saw of that largest Deer—the Moose—nearly 500; 275 of them in a single fortnight during the fly-season of 1910.

The Indians of this region all agree in saying that thirty years ago the Moose was a rare, if not almost unknown, inhabitant. Yet there are reasons to believe that at some remote time his dominion was not unlike the present. On many of the rocks, for instance, there are half-obliterated paintings attributed by the Indians to a medicine man named Amo, who lived vaguely "t'ousand years 'go"; and nearly all these paintings include the figure of a moose. The horns and the hump on the back are unmistakable.

The increase of the moose in the last thirty years has coincided with the decline of the Indians; the natives still surviving are generally a feeble lot, whose hunting-grounds are no longer far afield. From his worst enemy, therefore, the moose has had little to fear. Moreover, he has been almost without rival, for the woodland Caribou that once roamed all over the region has gradually withdrawn until to-day in a whole winter only an isolated band or so may be seen.

Another significant change in the region is the disappearance of wild rice (*Zizania aquatica*), called by the Indians "manomin." Formerly it was one of the Indians' chief foods; they gathered it in great quantities every autumn and it attracted hosts of ducks. To-day it is very rare; in three thousand miles of canoeing I saw it above water only two or three times and then always in small patches. The explanation, I think, is connected with the moose. Though writers never mention wild rice as one of his foods, there can be no doubt that in these parts at least it is a favourite. I remember one day we saw three moose feeding in a shallow bend of the river. When we had frightened them away, I said to my Indian: "Billy, there are no lily-pads here. What were they eating?" For reply, Billy thrust his arm under water and pulled up a bunch of light green grass—the same that I had seen hanging from the mooses' mouths. It was wild rice.

Wherever in the Rainy Lake District moose are seen in large numbers, careful investigation, I think, will reveal more or less of this same wild rice, half-developed under water. The moose, though they occur in all parts of the region, tend to congregate in these special feeding-grounds. I have seen ten together, seven of them bulls, in one bend of the Big Turtle River; and every one was feeding on wild rice.

Browsing in the river, the moose usually walks out to the height of his belly. If he feels no fear, he dips his head regularly for a period of from ten to thirty seconds and lifts it during one

to fifteen seconds; such, at least, were my conclusions, after roughly timing a number of feeding bulls. Not having a stop-watch, I arranged with Billy to signal me every time the animal either raised or lowered his head.

To get rid of flies, the moose often completely immerses himself. I have seen large bulls swim out beyond their depth, sink their heads, and be gone from sight a second or so, the hump reappearing first. The bulls, as a rule, venture out much farther than the cows; ten times to one where a moose is overtaken in deep water by canoe it is a bull. This is partly, I think, because the bulls have no responsibility in protecting the calves, and partly because they seem to be much more afflicted with flies than either cows or calves. Throughout June, July, and often the greater part of August, the head and withers are plastered with flies—particularly with little grass-green wedge-shaped flies. When the bull immerses himself they merely hang above the water till he reappears. Several times when we have overtaken a bull in mid-lake these flies have transferred themselves to our backs and there they stuck, stubborn to all slapping, till we smoked them off over the fire. The cows and calves, on the other hand, seem to be comparatively free from these pests; and I have often wondered whether the heat and blood in a bull's new antlers may not help to make him a target.

Last spring opposite our camp there was a bay, where we could see the moose come to feed morning, noon, and evening. They usually remained an hour or so, and often at night, too, we could hear them splashing and grunting. In general, however, though I have seen more moose at sundown than at any other time of the day, I have not found them confining their visits to any particular hours. If unmolested, many of the bulls during the fly-season seem to remain in the water the greater part of the day; even when disturbed they often return quickly. Nor do moose cease to enter the water when the flies are gone. I have seen a cow up to her belly on the first of November, a few days before the river froze. They have a fondness for tramping through the creamy grey ooze that covers the bottom of many streams. Often you will see it sticking to their legs when they stand on the shore; and I remember certain shallow lakes where the bottom was channelled in all directions with their furrows. Then, too, especially early and late in the year, they sometimes take long swims. Last spring I saw two crossing the lake at a place not less than two miles wide. In this way they often become an easy prey to pot-hunters; one of my own canoemen had thus slain a bull with an axe. Men have even been known to jump on the backs of swimming moose.

Of the extraordinary tameness of moose in regions where they are seldom molested there are many records. They seem to have a primitive curiosity about Man comparable to our own about them; and this is especially evident in the untravelled Rainy Lake District. Again and again we approached within fifty feet

without causing uneasiness; and four times we came as near as thirty feet in plain sight and took a dozen or more photographs. I even changed my roll of films.

The most singular experience occurred on the 2nd of October, 1909. It was about half-past four o'clock in the afternoon; the sun was low, and we were looking for a place to camp. All at once we heard the throaty grunt of a bull moose. Paddling quietly into a shady bay, what was our surprise to see a little yearling cow run out from the birch trees and come towards us whinnying! The next moment there was a loud crashing, and a tall heavy two-year-old bull broke through the trees with a rush. I took a photograph at once, for I thought they would turn and flee. Instead, as we drifted nearer and nearer, the little cow walked out toward us along the edge of the shore as if for protection. The bull, seeing us, checked his pace and waded stiff-legged into the water as high as his knees. In evident fear of him, the little cow kept whinnying and edging off, while he, advancing within fifteen feet of us, lowered his head, turned broadside with one eye on the cow, and sniffed at us suspiciously like a dog. The cow, as if satisfied with her temporary immunity, now began to feed. The bull made no attempt either to leave or to attack us. It was only at last when I spoke, after thirteen pictures, that they took fright; and then the cow, instead of running away with the bull, entered the water behind us and swam across to the other side.

The young moose, as a rule, seem to be less cautious than the old. On the 11th of June, 1910, we paddled up the river to the same bend, where the day before we had seen ten moose. This day there were seven, and one by one they walked slowly away into the woods, all except a little fellow that I mistook at first for a cow. When we glided nearer, I saw two round knobs of horns just peeping out of the forehead between his eyes and ears. They were his first antlers. As we approached, he fidgeted a little and looked at us with a mild sort of curiosity. Then down went his head—but only halfway, for the tips of the ears still protruded. Presently, completely reassured, he disappeared under water. He was down on his knees. When he rose, he shook his head till the long ears flapped against his cheeks. Then, whining softly and stretching his neck forward, he took a step toward us. I could almost have touched him with my hand; but Billy, always cautious, began to paddle backwards. Several times the little fellow tried again to approach us—for exactly what purpose I have never known. He seemed to be entirely friendly. At last I spoke, and away he went.

There is a theory among some sportsmen who have only shot moose that drooped ears are a sure indication of a wound. On the contrary, the moose lowers his ears for as many reasons as any other animal. Perhaps it is safe to infer that a moose with ears always drooped is injured; but the pictures of the friendly little bull show him with ears one moment erect, the next drooped, and again out straight. Sometimes they are lowered on account of

flies, sometimes to let the water run out, and almost invariably when the moose is either apprehensive or at bay. A cow with twin calves, which I photographed last spring, lowered her ears when she began to feel uneasy about our presence. We were only thirty feet away. At first she seemed not to mind; but the repeated click of the shutter alarmed her. She appeared to be wavering between friendliness and defiance. And I have observed the same behaviour repeatedly under similar conditions.

Indeed, the moose seems to be an animal of mixed emotions. Unlike the White-tailed Deer, he seldom bounds away at first sight of man. He will have a good second look unless there is immediate danger. Curiosity or indolence, or even friendliness (and I really believe in the last motive), frequently holds him until he has had proof of evil intentions. Often, having crept up stealthily upon a moose either by canoe or through the bush, I have been amused to find that he was watching me wide-eyed all the time. How often too, while the canoe passed, I have seen them peering out unalarmed from behind their ambush. And certainly the more they see of men without suffering injury, the more careless they become. Passing up and down the same eight-mile stretch of river at least once a day, last June, I was surprised at the change that occurred in a week. At first I could never get nearer than a hundred yards. We always went quietly and with as few motions as possible, and we never pursued an animal that had taken fright. At the end of the week hardly one of them would budge until we were within seventy-five feet; and if we returned half an hour later, there they were again in the water. Some of them never left, unless we turned toward them.

When we frightened them, it was either by unusual noises, sudden movements, the scent of our bodies, or above all by the sound of the human voice. No doubt, experience of the gun changes the order; the scent then becomes of first importance. I believe, though, that there is nothing alarming in the scent itself except as it is novel or as it recalls deadly memories. The cow and calves of which I spoke above may not have scented us, for there was a slight breeze in our favour. With the young bull in the water and the other bull and cow calf it was different. In the former case the breeze blew straight away from us; in the latter there was no perceptible breeze at all, but it would be idle to question the powers of a sniffing bull at from 15 to 20 feet. It is only the human voice, so far as I can discover, that never fails the first time to cause a panic. Whenever otherwise we were admitted to the closest intimacy, it broke the spell at the first word. There seems to be something unearthly about it that jangles the moose to the very heart.

A peculiar feature of the moose is the bell. Mr. E. T. Seton, in his memorable 'Life Histories of Northern Animals,' cites a bell 18 inches long as unusual. For an average of all moose, young and old, it certainly is; but, without actual measurements, I have a strong impression nevertheless that for bulls of three,

four, and five years even two feet is not rare. In cows and yearling bulls the bell is usually small and delicate. In bulls a few years older I have often seen it swinging like a tassel. It is the old bulls with large fully-developed antlers—the bulls usually sought by sportsmen—that have no more than a thick stump of a bell. The Indians believe, as Mr. F. C. Selous suggests in his 'Recent Hunting Trips in North America,' that it gets torn off or dries up. Perhaps both may happen, or it may even freeze off during the winter.

Except some of the yearlings and an old mother or so with calves, the moose in the Rainy Lake District are all fat and sleek. In September they fairly bulge. They seem lazy and satisfied, as if they had found the true land of plenty. They are not too indolent, however, for play—at least not the younger ones. Once, in June, I saw two of them (young bulls, I think, though I was too far off to be sure) frolicking on a sand beach. They cantered and reared and stopped short and wheeled round exactly like young horses, and at last, without warning, bolted into the bushes. Again, in September I saw a half-grown grey calf cavorting on the edge of a bay. A very fat cow and a huge glossy bull in full armour stood ankle-deep in the water, gazing at each other in stupid indecision. They seemed to be equally infatuated. The little calf meantime enjoyed all manner of caprices, just as if he considered his mother's new company a stimulating adventure for himself. It reminded me of an exuberant boy tossing his hat in the air.

During the rutting-season also we once tried the effect of the much-discussed "calling"—an art almost unknown in this region. It was a warm afternoon—about three o'clock on the 30th of September. We had just paddled a hundred yards or so beyond a portage, when we heard the low, languorous, lustful, two-noted grunt of a bull. In spite of the sun in our eyes, we thought we saw him on the shore about three hundred yards to the right of us. My Indian with unaided voice gave what seemed to me a perfect imitation. Immediately, we heard the moose reply and wade out into the water. The Indian repeated the call several times, and the bull began to swim leisurely toward us. The call sounded so easy that I could not resist trying myself. This seemed to make no difference. The moose swam straight toward us. We then kept still. When he was about one hundred feet away (a three-year old bull, as we judged), he suddenly caught sight of us. With evident surprise he turned and swam swiftly for shore. Whatever else he had expected, I am sure he had had no thought of man—even though my own call, at least, must have been seriously defective. I should conclude, therefore, with Mr. Selous that, where moose are unaccustomed to being deceived, a bull in a state of frenzy may be attracted sometimes by other sounds than the perfect call.

The moose, like all creatures, sometimes makes fatal miscalculations. A real tragedy was recently reported to me in a letter from

Mr. Louis Hamel, Postmaster at Mine Centre, Ontario, to whom my Indian sells furs. He said that, early in the winter, Billy, having gone up the river where we counted so many moose last spring, saw some twenty of them frozen in the ice. Evidently they had tried to cross too early and had broken through. Perhaps no one moose would have misjudged the strength of the ice for his own weight; but it is rare for such large numbers to travel together. Like men, sometimes, on a stage, they had forgotten to reckon the combined pressure.

Such accidents, happily, are rare. There can be no doubt that moose are plentiful in all parts of the vast Rainy Lake District; for, though one may travel several days or more without seeing the animals themselves, the signs are everywhere. If one forgets, however, that the moose tend to congregate in certain favourite feeding-grounds, it is easy from various record tallies to over-estimate their total number. It is true that I saw 44 in one day during the fly-season; but, on the other hand, during five months' travel the previous year, I had never seen more in a single day than eight.

If moose were once before plentiful in this region long ago, as some people suppose, there is no certainty that the present conditions are permanent. Whatever swept them away before, whether wolves, or men, or pestilence, may recur. One thing seems sure—year by year they are pushing farther north toward the edge of Hudson Bay. Perhaps in time by this very movement their southern range will be deserted; but more likely they are merely recovering old ground by force of expanding numbers. Wolves in the Rainy Lake District are still scarce, the Indians cannot return, and the shooting-season—perhaps unnecessarily late—comes at a time (Nov. 1st to 15th) when the danger of freezing lakes keeps sportsmen close to the settlements. All these safeguards together with the ideal character of the country—its innumerable lakes and rivers and its abundant food-supply—seem almost to ensure the perpetuation of this noblest of American game animals.

In the very heart of the region, too, Ontario and Minnesota have wisely set aside contiguous tracts of more than 3500 square miles, where the moose are protected for all time. Thus, even with the inevitable increase in shooting, and the probable establishment of an earlier open season, the prospects for the future are auspicious. It is a pleasant and noteworthy coincidence that that animal which writers invariably describe as "prehistoric-looking" should have proved among the ablest in modern times to hold its own.
